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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,532	01/12/2004	Dong Guk Kim	8733.475.10-US	8257
7590	05/19/2004		EXAMINER	
Song K. Jung MCKENNA LONG & ALDRIDGE LLP 1900 K Street, N.W. Washington, DC 20006			QI, ZHI QIANG	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

(K)

<b>Office Action Summary</b>	<b>Application No.</b> 10/754,532	<b>Applicant(s)</b> KIM ET AL.	
	<b>Examiner</b> Mike Qi	<b>Art Unit</b> 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-13, 16, 17 and 20 is/are rejected.
- 7) ☒ Claim(s) 14, 15, 18 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/893,557.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11-13, 16-17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 5,724,107 (Nishikawa et al).

Claims 11 and 12, AAPA discloses (specification page 2, line 12 – page 8, line 7;

Figs 1 – 2) that a reflective and a transfective liquid crystal display device comprising:

- intersecting a plurality of gate lines (102 or 202) and data lines (105 or 205) on a first substrate (101 or 201);
- forming a thin film transistors (TFTs) on the intersections of the gate lines (102 or 202) and the data lines (105 or 205), and the thin film transistor having gate electrode (102a or 202a), semiconductor layer (104 or 204), source electrode (105a or 205a) and drain electrode (105b or 205b);
- forming a capacitor lower electrode (102c or 202c) of a storage capacitor on the same plane as a gate line (102 or 202);
- forming an insulation film (gate insulation film 103 or 203) on the capacitor lower electrode (102c or 202c);

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- forming a capacitor upper electrode (105c or 205c) on an upper portion of the capacitor lower electrode (102c or 202c);
- forming a reflective electrode (107) connected with the drain electrode (105b);  
(concerning claim 12)
- forming a reflective electrode (207a) connected with the drain electrode (205b) at the reflection area (I);
- forming a transfective electrode (207) connected with the reflective electrode (207a) at the transmission area (II).

AAPA does not expressly disclose that a capacitor upper electrode being formed integrally with the drain electrode.

However, Nishikawa discloses (col.1, line 49 – col. 2, line 65; Figs.1-2) a conventional liquid crystal display having a storage capacitor electrode (12) that is presented along a periphery of the pixel electrode (14P) and overlaps with the pixel electrode (14P) on the substrate (10) with the insulation layer (13) sandwiched therebetween to form a storage capacitor. Therefore, the pixel electrode (14P) (conductive material) would be the capacitor upper electrode and electrode (12) would be the capacitor lower electrode, and the capacitor upper electrode (such as the conductive material 14P) is formed integrally with the source electrode (14s) on the capacitor lower electrode (12). It was common and known in the art that the source electrode and the drain electrode having staggered structure and having same function, and that such structure showing in the Figs.1-2 are a conventional liquid crystal display, and the storage electrode (12) functions not only as the storage capacitor but also as a

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light-shielding layer covering the periphery of the pixel electrode (14P) to improve the aperture ratio of the display.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a capacitor upper electrode formed integrally with the drain electrode as claimed in claims 11 and 12 such as taught from the conventional liquid crystal display for improving the aperture ratio of the display.

Claims 13 and 17, AAPA discloses (page 5, lines 6-7 and page 6, lines 19-20) that the material of the insulation films uses silicon nitride (SiNx) or silicon oxide, and that would have been at least obvious.

Claim 16, lacking limitation is such that the capacitor upper electrode extends along a boundary part between the reflective electrode and the transmissive electrode.

However, Nishikawa discloses (col.2, lines 53-65; Figs.1-2) that the pixel electrode (14P) and the non-transparent storage capacitor electrode (12) (a reflective electrode) with the insulating layer (13) constitutes a storage capacitor, and the capacitor upper electrode (14P) extends along a boundary part between the reflective electrode (12) and the pixel electrode (14P) (a transparent electrode), such that the display area would be larger and would improve the aperture ratio.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a capacitor upper electrode extends along a boundary part between the reflective electrode and the transmissive electrode as claimed in claim 16 for improving the aperture ratio.

Claim 20, AAPA discloses (Fig.2B) that a second passivation film (206b) (insulation film) is disposed between the reflective electrode (207a) and the transmissive electrode (207b).

***Allowable Subject Matter***

3. Claims 14-15 and 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither discloses nor teaches a method for manufacturing a reflective and a transfective liquid crystal display device comprising various elements as claimed, more specifically, as the following:

a passivation layer is formed between the capacitor upper electrode and the reflective electrode, such that there is no contact hole between the capacitor upper electrode and the reflective electrode, so that a depression at the pixel electrode is improved [claims 14 and 18; as shown in Figs.3A and 3B].

Claims 15 and 19 are dependent on the claims 14 and 18 respectively.

The closest references AAPA, US 5,724,107 (Nishikawa et al) and US 6,362,507 (Ogawa et al) disclose a structure of a liquid crystal display device having a passivation film formed over a storage capacitor, but there is a contact hole in the passivation film using for a reflective electrode contact the capacitor upper electrode, so that having a

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depression problem in the pixel region. Ogawa discloses a structure of an electro-optical device using several interlayer insulating films over the storage capacitor, but that is not only one insulating film as a passivation film as claimed.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi  
May 3, 2004



**ROBERT H. KIM**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**